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(54) **Method and apparatus for measuring channel state information**

(57) A method and apparatus for transmitting in a multi-antenna communication system (100). Each of a plurality of antennas (116,122) are assigned with a different one of a plurality of groups of sub-bands. The plurality of groups of sub-bands each include a different subset of the plurality of sub-bands, where the plurality of sub-bands of a first group are non-contiguous. Transmitting from the plurality of antennas (116) and simultaneously using the plurality of groups of sub-bands, where transmitting from each antenna (116) occurs on the group of sub-bands assigned to the antenna (116). A base station for use in the multi-antenna communication system (100) including a first processor (332) for pre-conditioning transmission data, assigning a plurality of pilot symbols to the plurality of transmit antennas (116), and assigning a plurality of sub-channel sub-sets to the plurality of antennas (116). The plurality of antennas (116) transmit each of the assigned plurality of pilot symbols over their respectiven assigned sub-channel sub-sets.

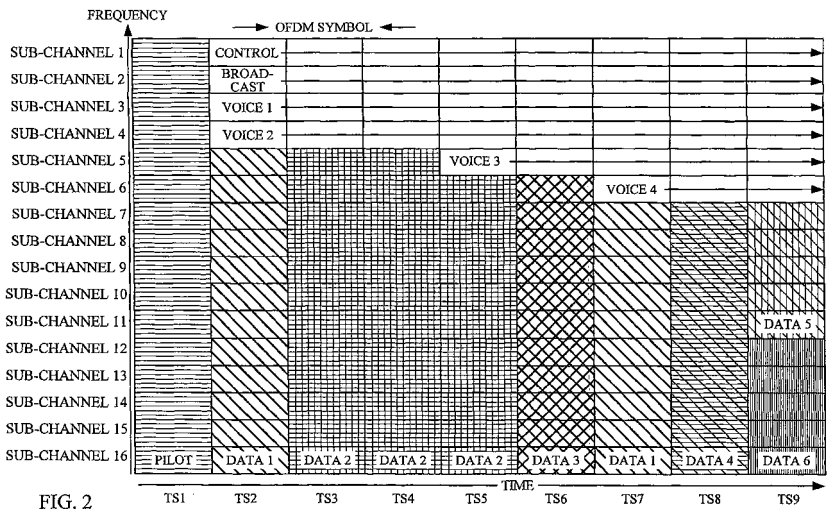

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 05 01 5739

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 5 914 933 A (CIMINI LEONARD JOSEPH [US] ET AL) 22 June 1999 (1999-06-22) * the whole document * -----	1-21	INV. H04B7/00
A	WO 00/04728 A (SAMSUNG ELECTRONICS CO LTD [KR]) 27 January 2000 (2000-01-27) * abstract * * page 8, line 10 - page 9, line 9 * * page 19, line 9 - line 21 * * page 20, line 4 - line 12 * * page 21, line 4 - line 16 * -----	1-21	
A	BAUM K L ET AL: "A comparison of differential and coherent reception for a coded OFDM system in a low C/I environment" GLOBAL TELECOMMUNICATIONS CONFERENCE, 1997. GLOBECOM '97., IEEE PHOENIX, AZ, USA 3-8 NOV. 1997, NEW YORK, NY, USA,IEEE, US, vol. 1, 3 November 1997 (1997-11-03), pages 300-304, XP010254599 ISBN: 0-7803-4198-8 * abstract * * paragraph [0001] * -----	1-21	

TECHNICAL FIELDS SEARCHED (IPC)

H04B
H04L
H04Q

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	28 August 2007	Mier, Ana

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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28-08-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5914933 A	22-06-1999	NONE	
WO 0004728 A	27-01-2000	AU 4934399 A	07-02-2000
		BR 9906601 A	21-11-2000
		CA 2302269 A1	27-01-2000
		CN 1275293 A	29-11-2000
		EP 1040689 A2	04-10-2000
		JP 3449985 B2	22-09-2003
		JP 2002521886 T	16-07-2002
		RU 2183387 C2	10-06-2002
		US 6728233 B1	27-04-2004

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